

LETTERS TO THE EDITOR

Note on the tannins of Velikathan (*Prosopis Juliflora*, D.C.)

Velikathan (*Prosopis juliflora*, D.C. Var. *glandulosa*, Sarg. Syn. *P. glandulosa*, Torr.) is highly variable in its habitat. The typical variety is a small or a moderate sized deciduous tree, armed with stout scattered auxillary thorns. It appears to have been first introduced into India from seed obtained through Kew¹ in 1877 and some of the drier parts of India have proved of great importance for afforestation work. It is recommended for planting in shifting sands in dry localities. It is also a useful source of supply of fuel and of famine fodder and a food for man in times of scarcity, the pods being sweet and edible². The plant is mainly used as a hedge plant.

However, in certain areas such as agricultural fields and habited areas, it has spread to such an extent that it is considered of great nuisance than a necessity. It is a very hardy plant difficult to eradicate completely, except to a certain extent by the herbicide propylene glycol butyl ether ester of 2, 4, 5-T.³

With a view to identify the utility value of this plant for the tanning industry samples were collected from the natural forest of velikathan available at CLRI premises, Madras.

Literature survey indicated that reports are available with regard to isolation of patulitrin glucose and sucrose from the

green pods,⁴ the fodder value of seeds⁵, prosopol, prosopenol and β -sitosterol from the aerial parts of the plant⁶ and from the root bark.⁷ However, no information is available in regard to the nature and quantity of tannins present in different parts of the plant. The present note deals in detail the isolation of tannins from different parts of the plant both quantitatively and qualitatively.

Experimental

The bark, leaves, heart wood, sap wood and root wood of the plant were collected separately and estimated for tannins by the official method of analysis and the results are given in Table 1. One kilogram of each plant part was shade dried and powdered in a mill. It was soaked in 3 litres of 90% acetone for 3 days, with periodical mixing. Acetone was decanted and filtered. The leaching was continued until extraction was complete. The combined extractions was concentrated *in vacuo* in N₂ atmosphere to remove the solvent. The extract was dried and weighed. Acetone extract of each plant part was chromatographed on Whatman No. 3 chromatographic paper by using the solvent 6% acetic acid in the first way followed by butanol:acetic acid:water (4:1:5) V/V in the second way.⁸ The chromatograms were developed with ferric chloride and potassium ferricyanide reagent.⁹ The data regarding the presence of different phenolic compounds, their R_f values and concentrations are given in Table 2.

TABLE 1

% of extract and tannin analysis of different plant parts of Velikathan

Sl. No.	Characteristic	Leaves	Heart wood	Root wood	Root bark	Stem bark	Sap wood	
1.	% of extract	0.125	13.6	5.66	6.20	16.8	1.00	
2.	% of tannin	0.05	5.18	1.74	1.04	0.60	0.28	
3.	% of non-tannin	24.25	17.34	7.41	18.06	15.86	14.46	
4.	% of insolubles	75.70	77.48	90.85	80.90	83.54	85.26	
5.	% of solubles	24.30	22.52	9.15	19.10	16.46	14.74	
6.	pH	5.8	7.4	7.4	7.1	6.8	6.9	
7.	Colour	Red	1.0	12.0	10.0	4.4	1.5	2.0
		Yellow	20.5	27.8	12.8	15.0	15.0	8.7

TABLE 2

No. of phenolic compounds present in different plant parts of Velikathan, their R_f values and concentration

Sl. No.]	Spot No.	R _f value		Heart wood	Root wood	Sap wood	Root bark	Stem bark	Leaves
		1st way	2ndway						
1.	1	0.43	0.70	****	**	***	**	***	**
2.	2	0.38	0.40	***	**	**	*	**	*
3.	3	4.45	0.88	**	**	**	traces	*	**
4.	4	0.31	0.87	*	traces	**	traces	traces	*
5.	5	0.32	0.58	**	**	*	*	*	*
6.	6	0.03	0.58	**	*	**	**	**	—
7.	7	0.27	0.30	*	*	*	*	*	*
8.	8	0.11	0.40	traces	traces	*	...	traces	traces
9.	9	0.05	0.72	*	traces	*	traces	*	—
10.	10-15	traces	traces	traces	traces	traces	traces

**** = Maximum concentration

*** and ** = Intermediate

* = minimum

Results and discussion

Table 1 shows that the percentage of tannins was highest in heart wood (5.18%), whereas in the case of other parts of the plant it was varying from 0.05-2%. In general it was noticed that all parts of the plant contain considerable amount of non-tannins vis-a-vis tannins. The colour of the extracts in all the cases is yellowish. In general, the extracts of the tanniferous plants give pH in the range of 4-5. However, in the case of velikathan the parts of the plant gave extracts with pH in the range of 6.8-7.4 except the leaves. The enhanced pH value may be due to the presence of considerable amount of basic compounds such as alkaloids¹¹ in this plant. From the data available it is clear that this plant cannot be utilized by the extract manufacturers for the tanning purposes.

Table 2 gives the details in regard to the number of phenolic compounds present in different parts of the plant with their E_p values and concentration. About 15 phenolic compounds were noticed with variable concentrations. Compound numbers 10-15 were present in trace amounts in all the parts. Further work in connection with the isolation and identification of various polyphenolics present in different parts of the plant will be published elsewhere.

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Sulphited oil fatliquors from vegetable oils

The traditional fatliquors based on soaps and sulphated oils cannot be used for fatliquoring purposes in places like Pallavaram, Madhavaram, Ranipet, Ambur and Vaniyambadi as the water available in the tanneries is so hard (maximum hardness being 200°H) that the fat gets immediately broken from the water emulsions. However, the sulphited oils are found to have good stability to mineral acids, inorganic salts and chrome, vegetable and synthetic tanning materials.

Studies on sulphited oil fatliquors based on fish and marine oils¹ were made at CLRI and the stability of water emulsions² of sulphited saidine fish oil was studied in detail in comparison with sulphated oils and its blends with the sulphated oils and raw oils.

The disadvantages of fish oil fatliquors are their crude nature, dark colour, foul smell and their non applicability to light, pale coloured and sophisticated gloves and garments. Hence light coloured fatliquors based on indigenous vegetable oils (single and in blends) have been developed for the first time at the CLRI and they find application in the processing of all types of leathers; and are especially highly suitable for light coloured top class sophisticated leathers. The added advantages of using such stable fatliquors are that they have good tolerance to hard water and acids and they can be employed in the tanning bath itself. Also, leathers

which are soft and supple but not stretchy are obtained.

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